

CLAIMS

1. A supersonic jet burner comprising:

5 a cylindrical burner main body having a combustion path on its central axis;

a fuel filling nozzle unit arranged at a base of said burner main body, wherein a tip nozzle of said nozzle unit is arranged to face a base of said combustion path;

10 a first combustion chamber formed ahead of said nozzle unit;

a plurality of first air ejecting ports circularly arranged so as to surround said first combustion chamber and facing to said combustion path so as to form a swirling combustion flow section;

15 a circularly arranged plurality of second air ejecting ports capable of ejecting whirling flows of high pressure air heated in a high pressure air flowing passage formed around the outer periphery of said burner main body so as to form a whirling high temperature combustion section;

a second combustion chamber arranged ahead of said whirling high temperature combustion section;

20 a narrowly drawn shock wave conversion section for raising a flow rate of combustion gas up to more than the sonic speed formed as a tip hole of said circular burner main body.

2. The supersonic jet burner according to claim 1, wherein:

25 an ignition nozzle unit capable of introducing ignition gas and auxiliary air having an ignition plug is arranged in said first combustion chamber and the tip of said ignition nozzle unit is bent directing to the tip of said fuel filling nozzle unit so as to eliminate influence from said swirling combustion flow section.

3. The supersonic jet burner according to claim 1, wherein:

30 said base of said burner main body is formed as a circular base plate to which a plurality of air importing pipes are attached outwardly;

the other ends of said air importing pipes are communicated with an air

distribution circular pipe unit which is connected to a high pressure combustion air supply means; and

said circular base plate is connected to a high pressure air passage arranged around a cylindrical portion of said burner main body so as to eject
5 required respective amounts of supplied air to said air passage from said first air ejecting ports and second air ejecting ports respectively.

4. The supersonic jet burner according to claim 3, wherein:

said cylindrical portion of said burner main body comprises an inner cylindrical body having said combustion path, an intermediate cylindrical body
10 and an outer cylindrical body;

said high pressure air passage runs a gap between said inner cylindrical body and said intermediate cylindrical body, then runs a gap between said intermediate cylindrical body and said outer cylindrical body via a cutout portion of said intermediate cylindrical body; wherein:

15 high pressure air in said high pressure air passage receives heat from highly heated combustion gas in said combustion path so that heated high pressure air by the heat exchange can be ejected from said second air ejecting ports ahead of said first combustion chamber as highly heated and pressured combustion air.

20 5. The supersonic jet burner according to claim 1 or claim 3, wherein:

plurality of said first and second air ejecting ports are arranged around said combustion path with respectively uniform pitches and said air ejecting holes are formed as tilted holes in the form of nozzle directing ahead.